Epidemiology of Tobacco Use in the United States

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Presentation to the Institute of Medicine Committee

"Reducing Tobacco Use: Strategies, Barriers, Opportunities"

Washington, D.C.

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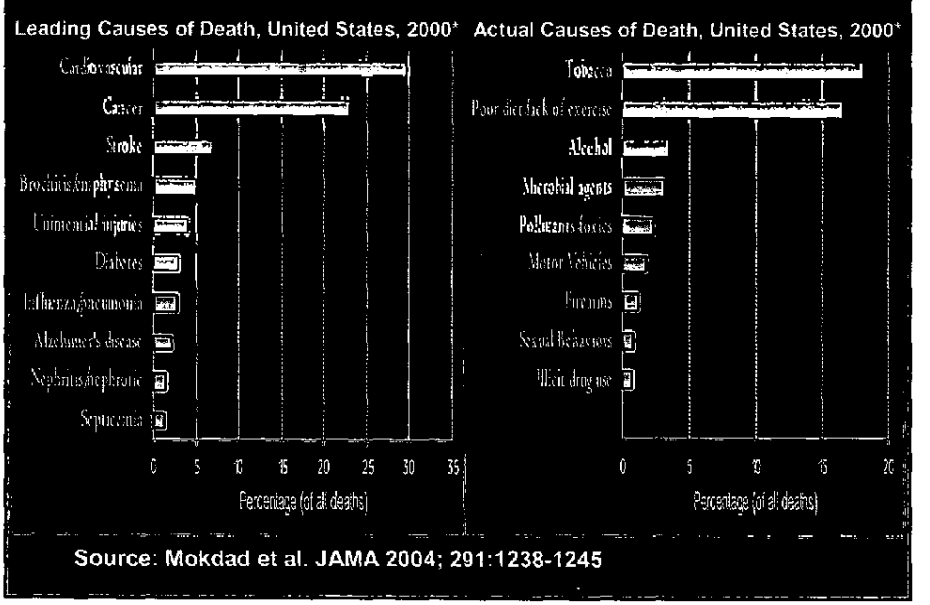
Chronic Disease and Related Factors



Source: Mokdad et al. JAMA 2004; 291:1238-1245

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Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Diseases Caused by Tobacco Use

Cigarette smoking causes:

- ✓ Coronary heart disease, cerebrovascular disease, atherosclerosis, and abdominal aortic aneurysm
- ✓ Cancers of the lung, larynx, mouth, esophagus, bladder, pancreas, kidney, cervix, stomach, and acute myeloid leukemia
- ✓ Chronic obstructive pulmonary disease, pneumonia, premature onset of and an accelerated age-related decline in lung function, all major respiratory symptoms (e.g., coughing, phlegm, wheezing, dyspnea), poor asthma control
- ✓ Impaired lung growth, respiratory symptoms, and asthma-related symptoms (e.g., wheezing) in childhood and adolescence; early onset of lung function decline during late adolescence and early adulthood
- ✓ Sudden infant death syndrome, reduced fertility in women, fetal growth restriction, low birth weight, premature rupture of the membranes, placenta previa, placental abruption, preterm delivery and shortened gestation
- ✓ Cataracts, hip fractures, low bone density
- ✓ Peptic ulcer disease in persons who are *Helicobacter pylori* positive
- ✓ Diminished health status (i.e., increased absenteeism from work, increased use of medical care services); adverse surgical outcomes related to wound healing and respiratory complications

Source: US DHHS 2004. *The Health Consequences of Smoking. A Report of the Surgeon General.*

Disease Caused by Tobacco Use

Involuntary smoking (environmental tobacco smoke) is a cause of:

- ✓ Lung cancer and coronary heart disease in nonsmokers
- ✓ Respiratory infections and symptoms in the children of parents who smoke

Smokeless tobacco causes:

- ✓ Oral Cancer
- ✓ Smokeless tobacco keratosis / leukoplakia
- ✓ Dental caries (possibly)

Cigars cause:

- ✓ Cancers of the mouth, larynx, and lung
- ✓ Coronary heart disease
- ✓ COPD

Source: Reports of the Surgeon General and NCI Monographs

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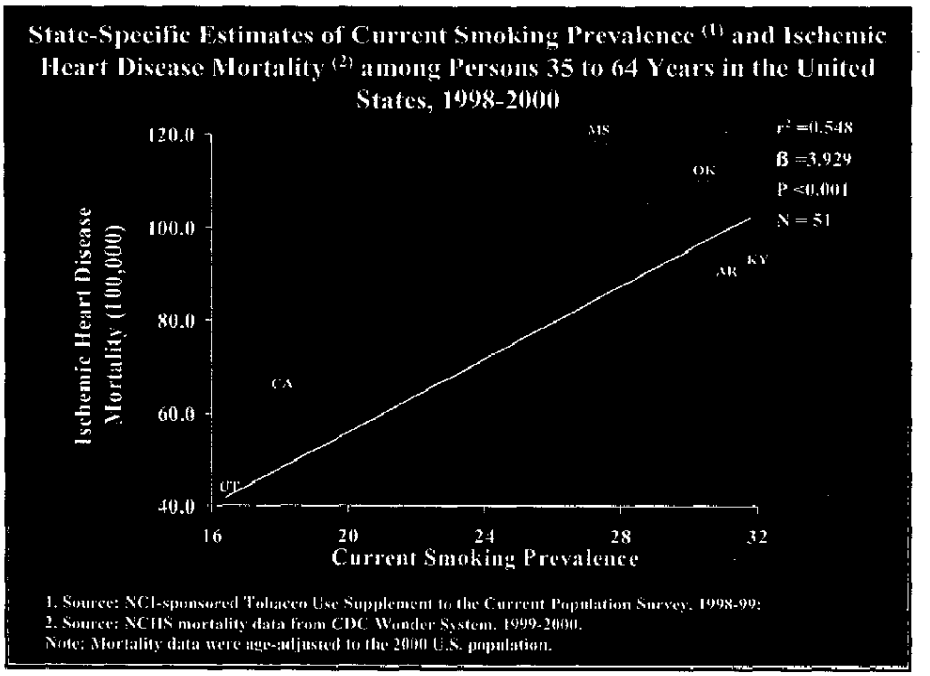
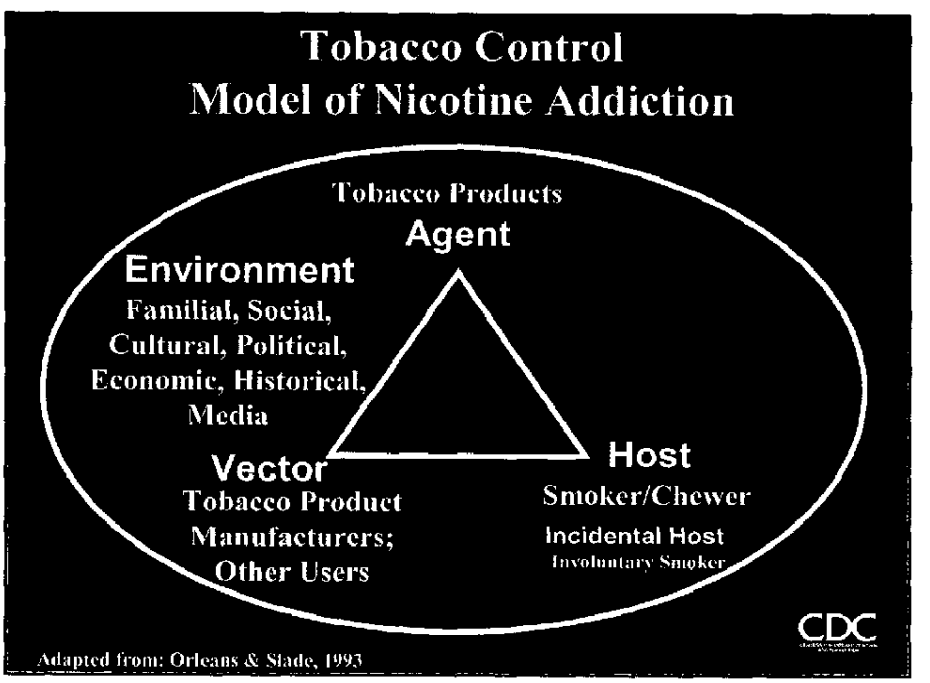
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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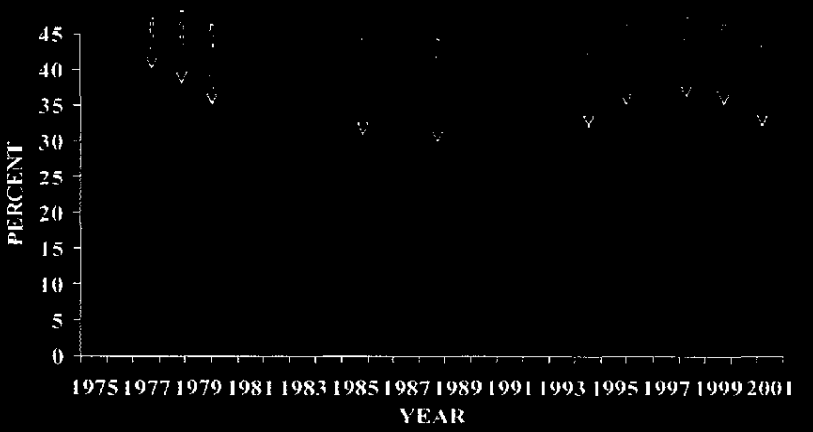
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Conceptual Model of Factors Influencing Trends in Adolescent Smoking – United States, 1975-2001

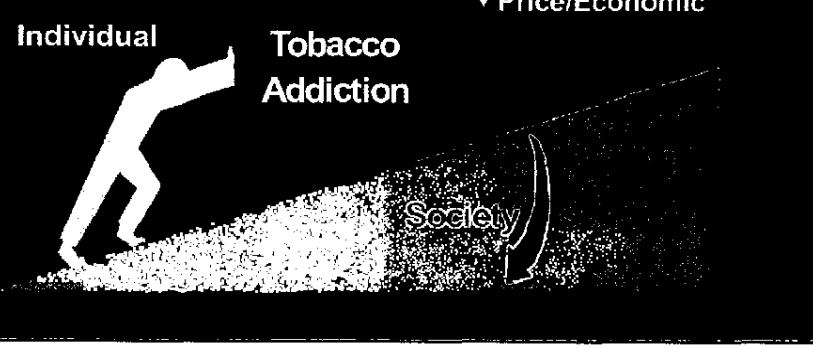


Data Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys

Paradigm for Tobacco Control

- Minor's access
- Advertising

- Cessation activities
- Prevention activities
- Clean indoor air
- Regulation/Liability
- Price/Economic



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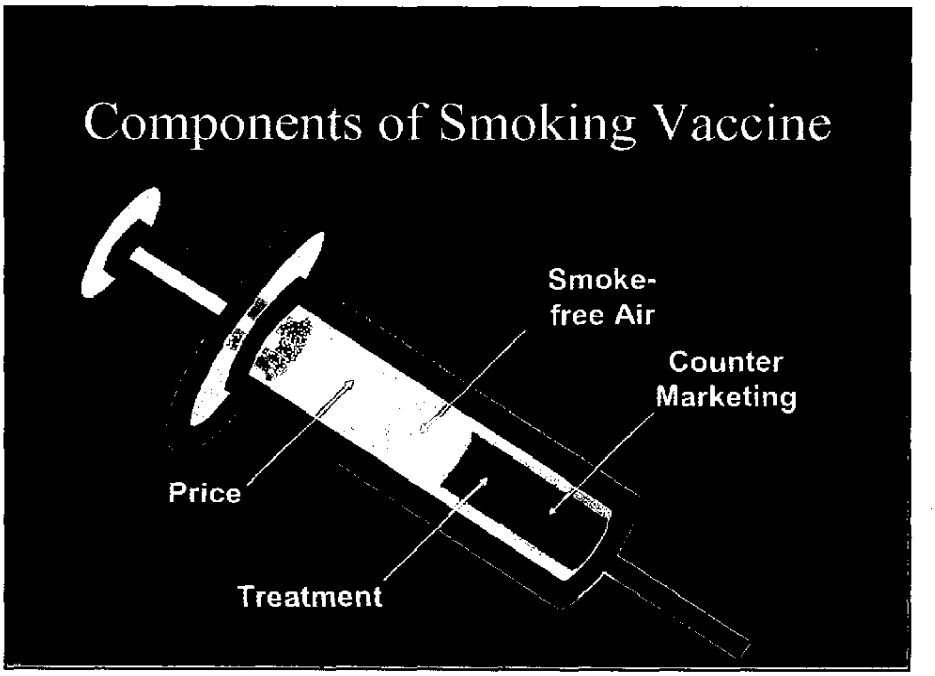
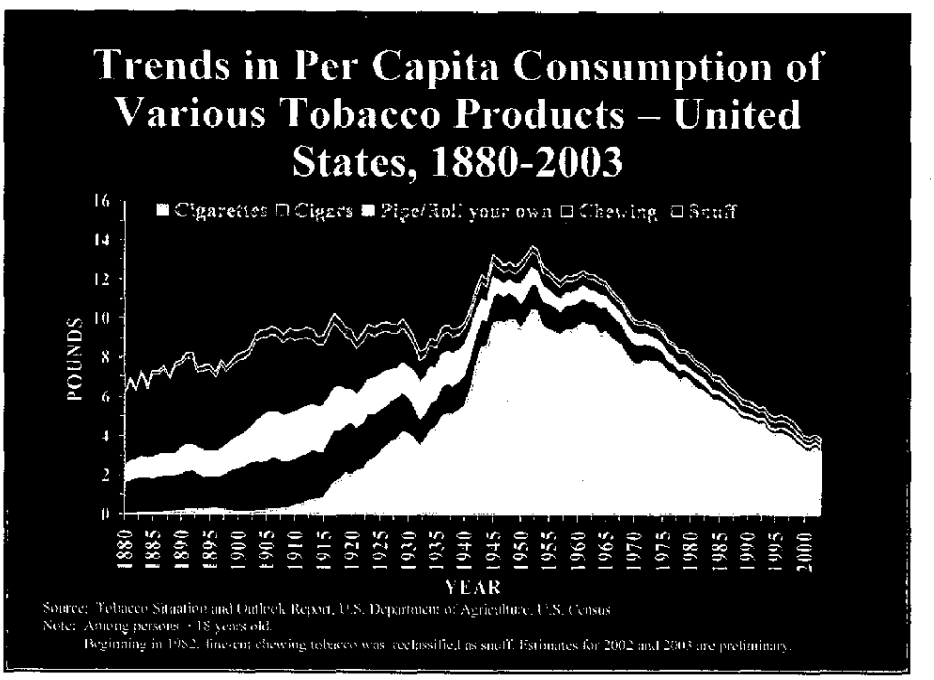
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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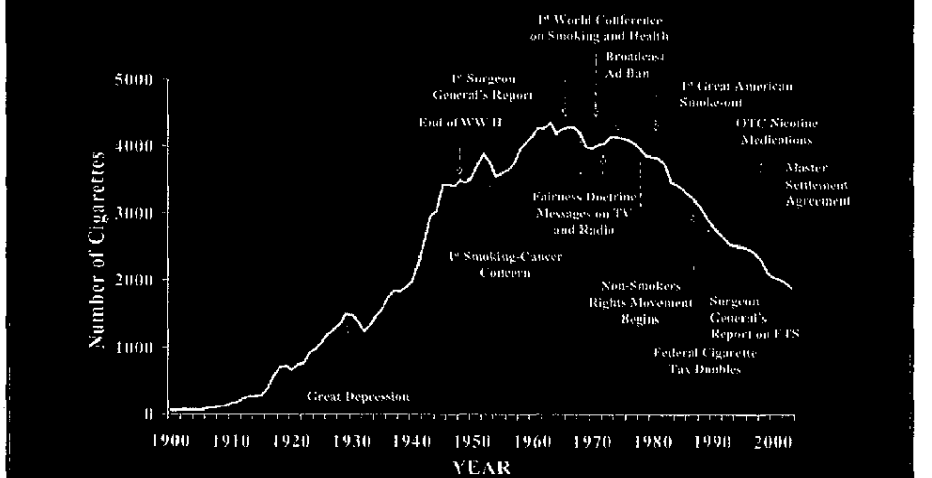
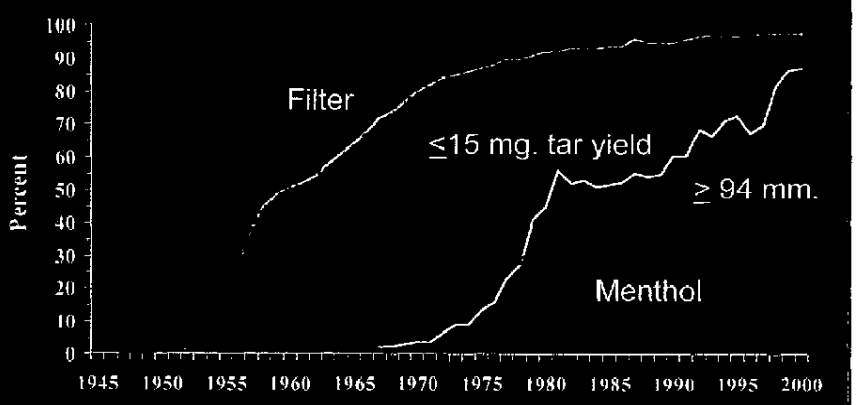
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Adult Per Capita Cigarette Consumption and Major Smoking and Health Events – United States, 1900-2003



Source: United States Department of Agriculture; 2002 and 2003 estimates are preliminary

Domestic Market Share of Cigarettes by Tar Yield, Filter Status, Length, and Menthol Status: United States, 1946 - 2000



Source: United States Department of Agriculture, 1962; Federal Trade Commission, 2001

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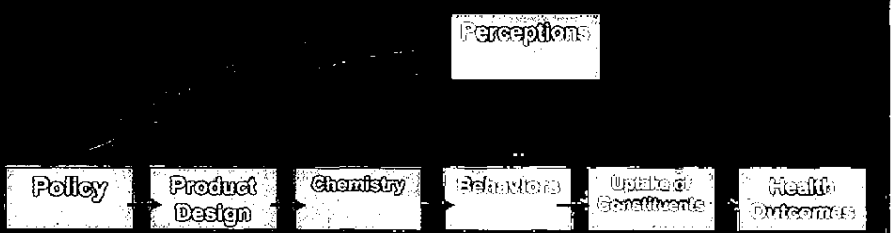
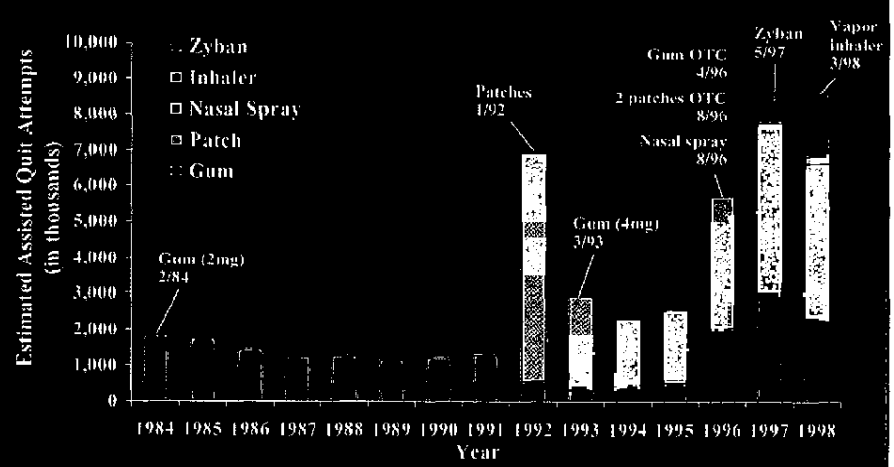
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Elasticity/Compensation Model of Policies Influencing Product Design and Chemistries and User Behaviors, Perceptions, Uptake of Constituents, and Disease Risk



Annual use of pharmacologic aids to smoking cessation— United States, 1984-1998



Source: CDC. MMWR 2000;65-68.

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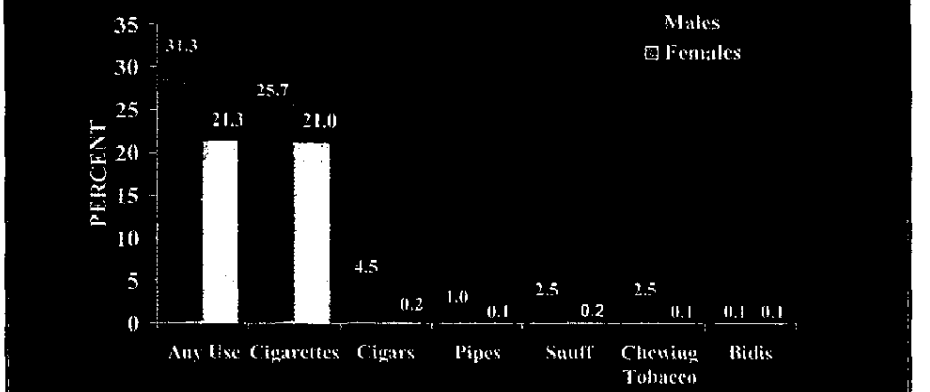
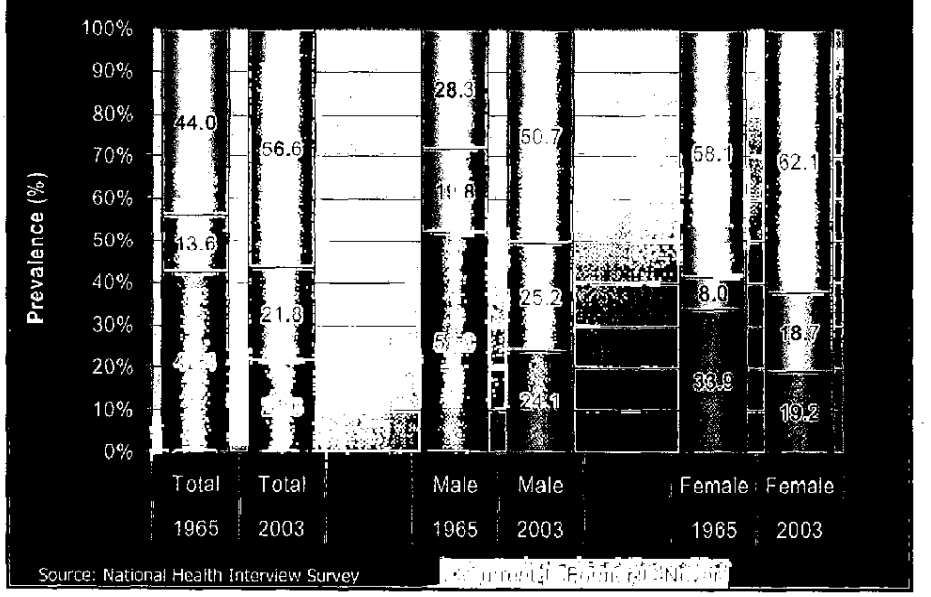
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Current Use Among U.S. Adults of Various Tobacco Products, by Sex – National Health Interview Survey, 2000



Note: Current users report using either every day or on some days
Source: National Center for Health Statistics

Change in Smoking Status 1965-2003



Source: National Health Interview Survey

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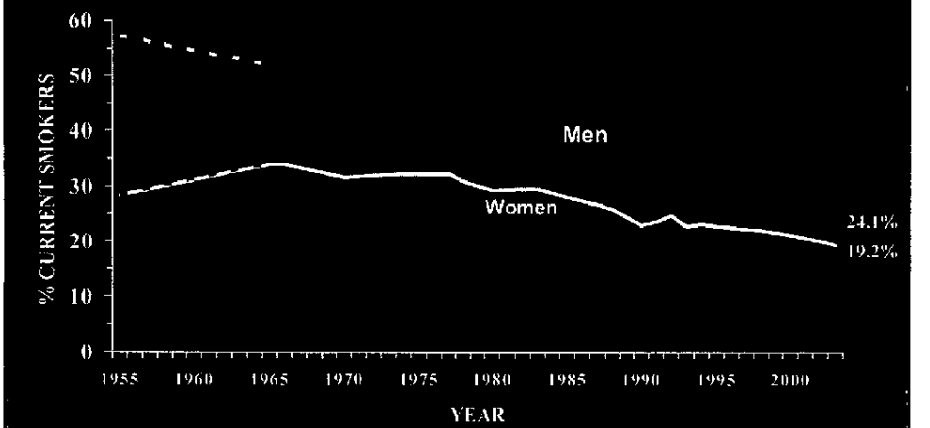
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

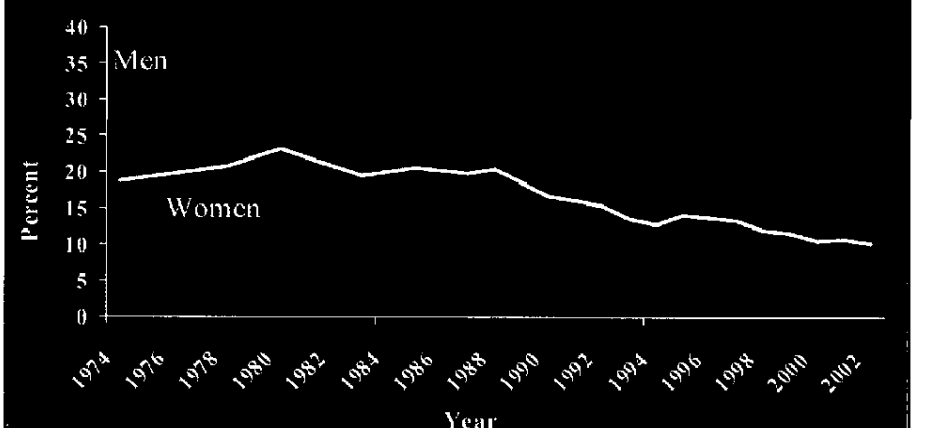
Trends in cigarette smoking* among adults aged ≥18 years, by sex - United States, 1955-2003



*Before 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes and who currently smoked. Since 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes during their lifetime and who reported now smoking every day or some days.

Source: 1955 Current Population Survey; 1965-2003 National Health Interview Surveys

Heavy Cigarette Smoking* Among Adults Aged 18+ by Gender – United States, 1974 -2002



Source: various National Health Interview Surveys, 1974-2002
*Smoking 25+ cigarettes per day

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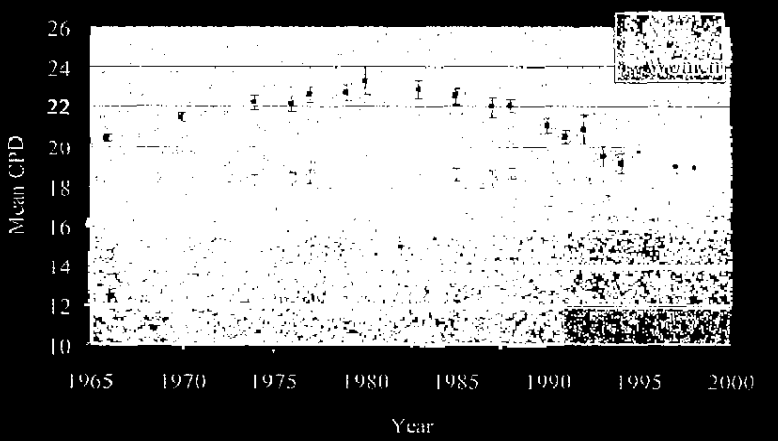
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

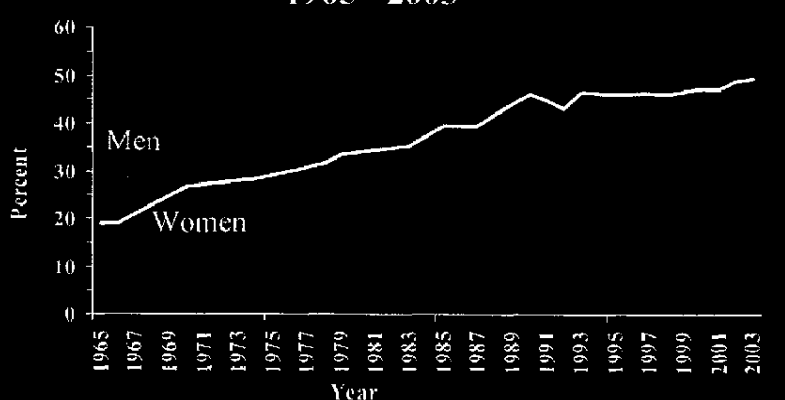
Mean Number of Cigarettes per Day



* Average number of cigarettes per day standardized to the age and race distribution of NHIS 1965. Brackets indicate 95% confidence intervals on the estimates.

NHIS Data

Percentage of Ever Smokers* Who Have Quit+, Adults Aged ≥ 18 Years, by Sex-United States, 1965 - 2003



Source: National Health Interview Surveys, 1965-2003; 2003 estimate is for January-September.
Centers for Disease Control and Prevention. National Center for Health Statistics and Office on Smoking and Health.

*Ever smoked ≥100 cigarettes.
+Also known as the quit ratio. Note: estimates since 1992 incorporate same-day smoking.

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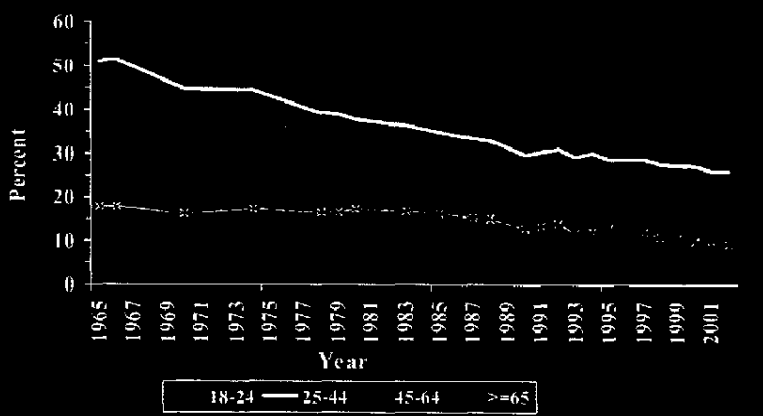
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

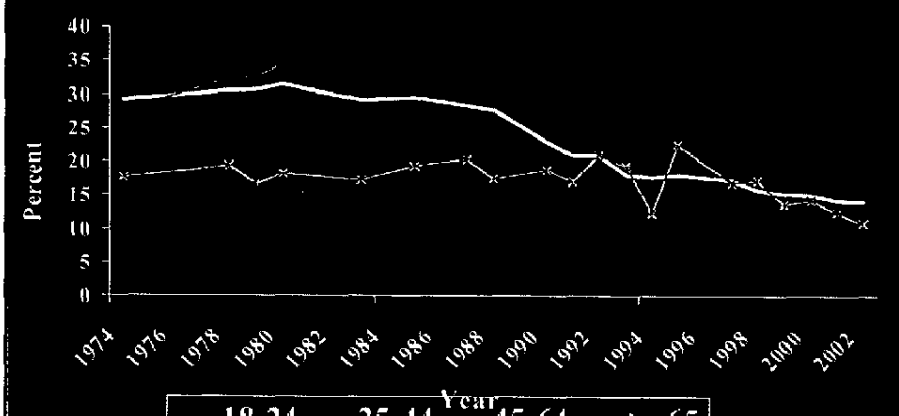
Trends in cigarette smoking* by age - United States, 1965-2002



*Before 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes and who currently smoked. Since 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes during their lifetime and who reported now smoking every day day or some days.

Source: various National Health Interview Surveys from 1965 - 2002, National Center for Health Statistics

Heavy Cigarette Smoking* Among Adult Smokers, by Age – United States, 1974 -2002



Source: various National health interview Surveys, 1974 - 2002
*Smoking 25+ cigarettes per day

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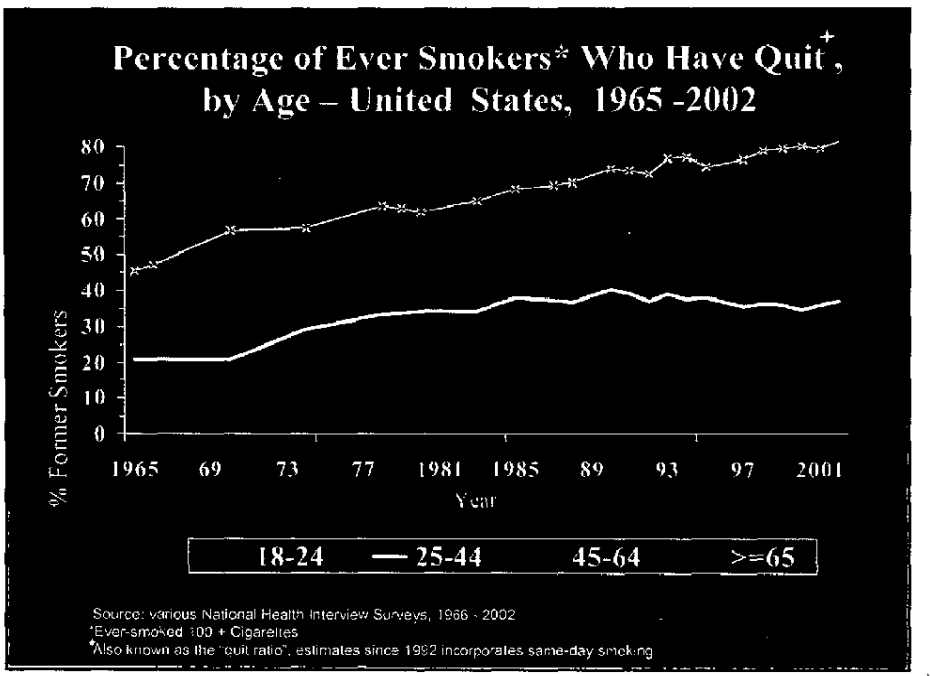
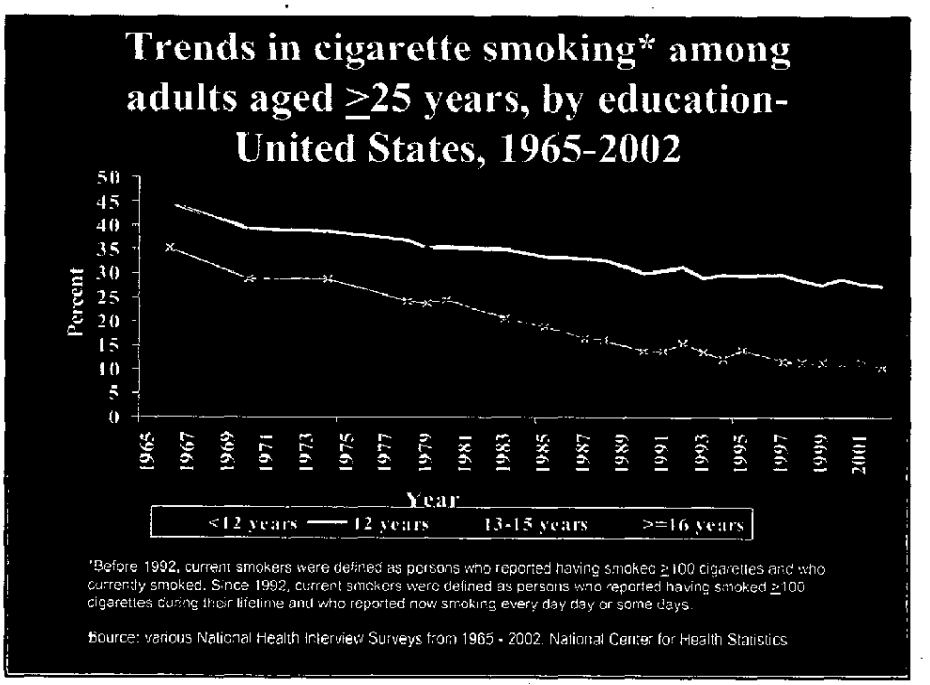
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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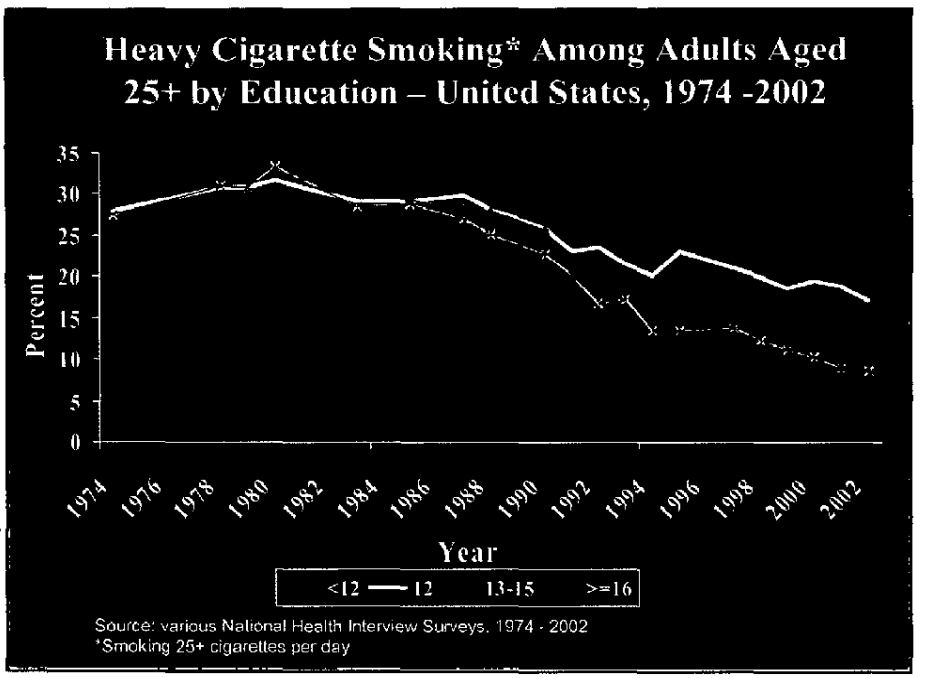
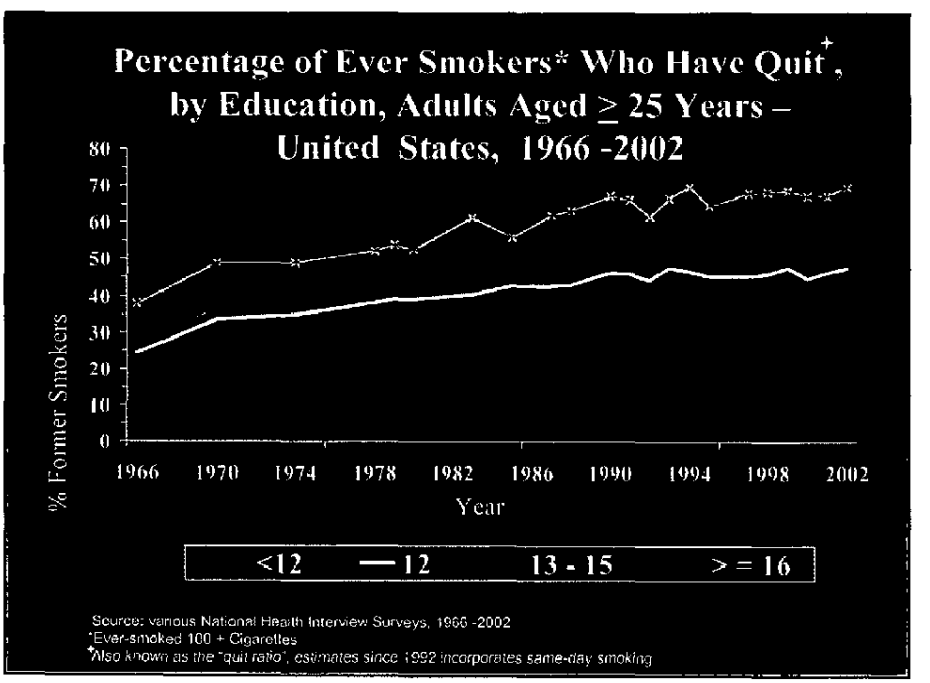
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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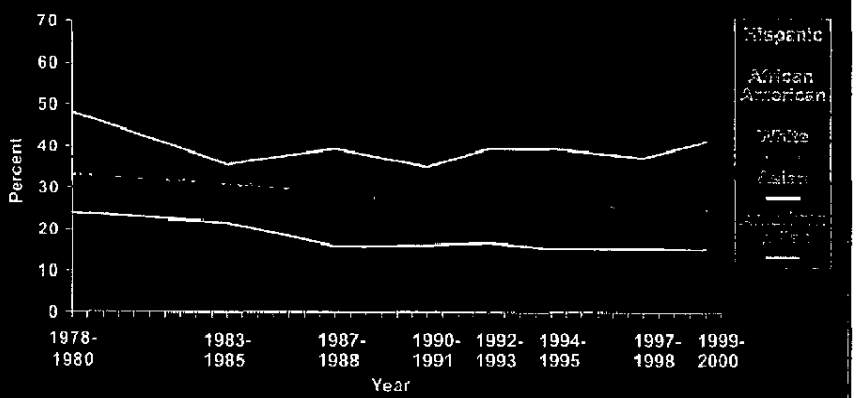
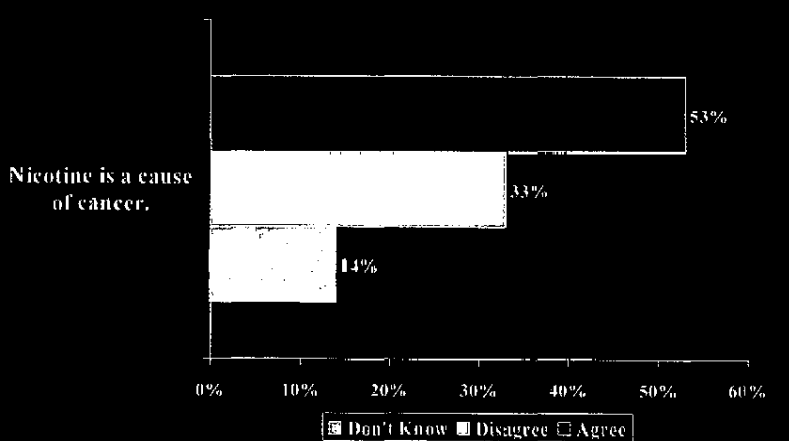
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Trends in the Percentage of Current Cigarette Smoking by Race/Ethnicity, Overall— United States, Ages 18+, NHIS 1978-2000



Source: National Health Interview Surveys, 1978-2000, selected years, aggregate data

Over half of smokers incorrectly report nicotine as a cause of cancer...



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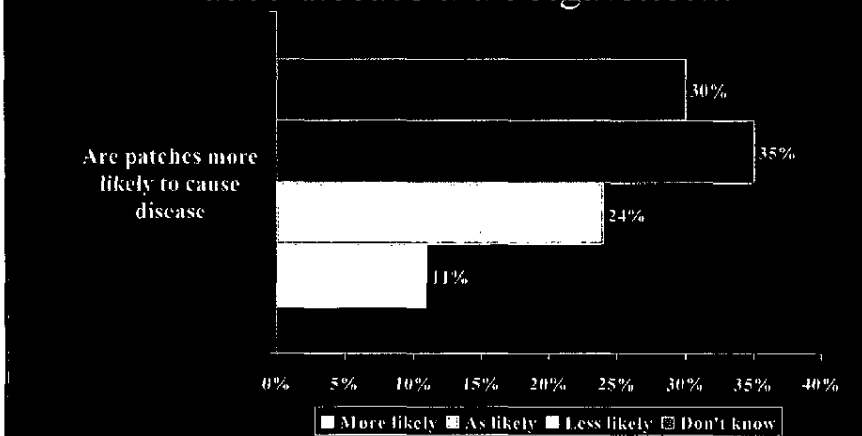
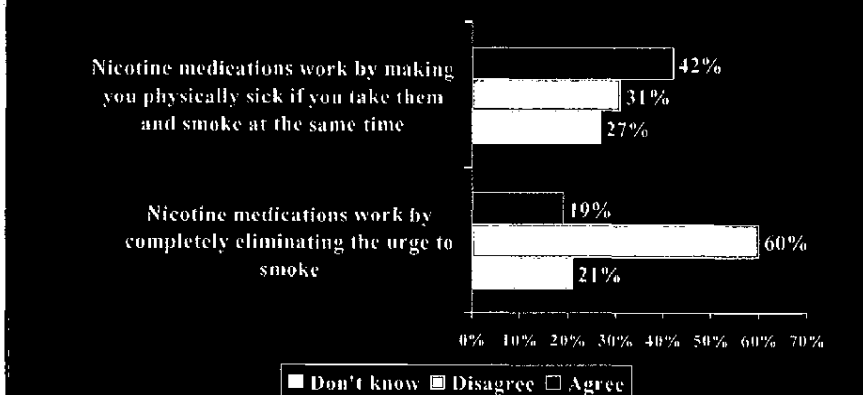
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Only one-third of smokers correctly report that patches are less likely to cause disease than cigarettes...



… and many smokers don't understand how NRT works.



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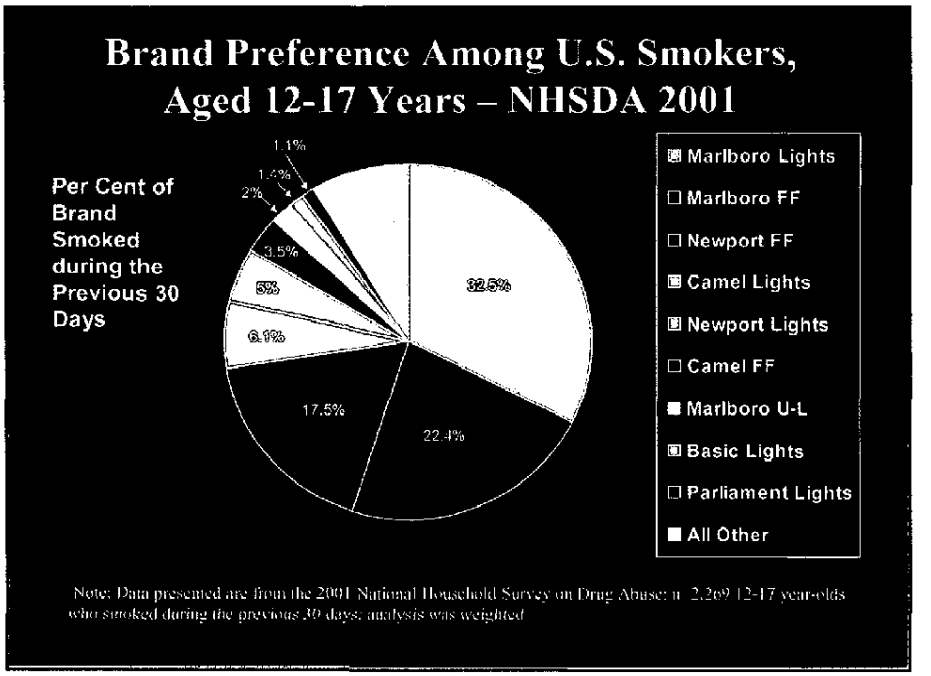
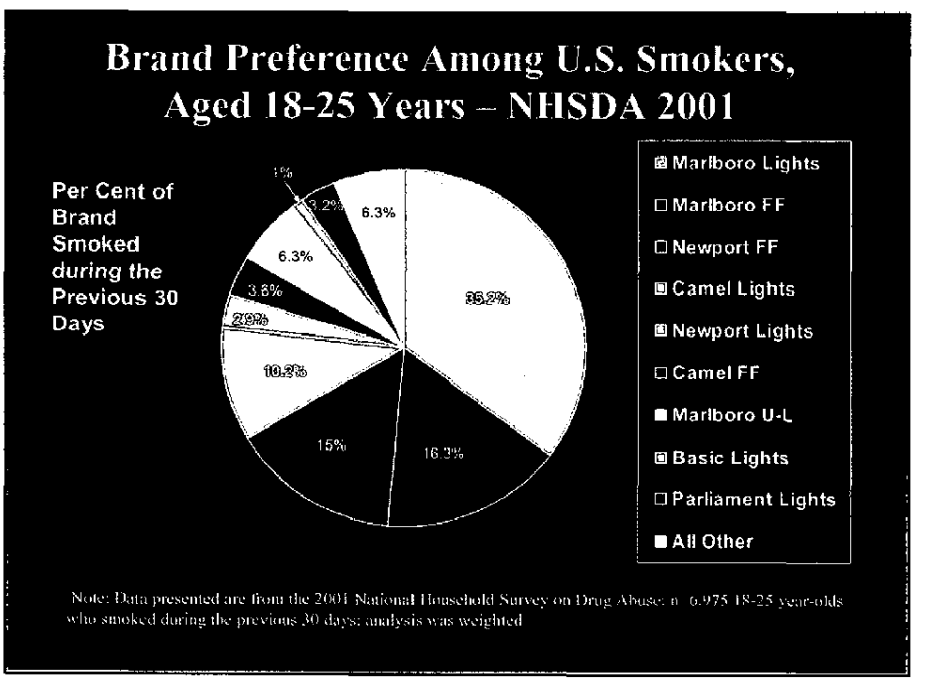
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Brand Preference Among U.S. Smokers, Aged 12-17 Years – NHSDA 2001



Note: Data presented are from the 2001 National Household Survey on Drug Abuse; n = 2,269 12-17 year-olds who smoked during the previous 30 days; analysis was weighted

Brand Preference Among U.S. Smokers, Aged 18-25 Years – NHSDA 2001



Note: Data presented are from the 2001 National Household Survey on Drug Abuse; n = 6,975 18-25 year-olds who smoked during the previous 30 days; analysis was weighted

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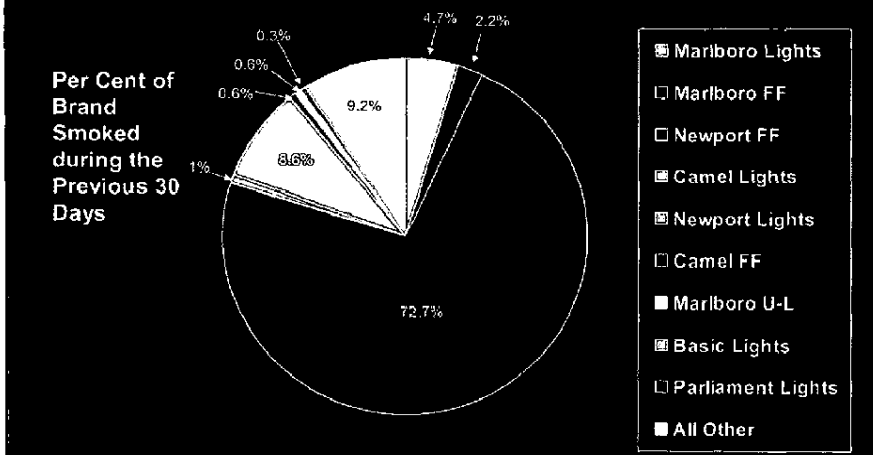
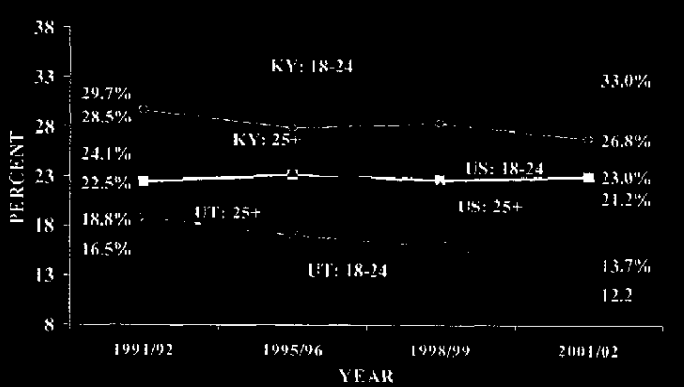
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Brand Preference Among U.S. African American Smokers, Aged 18-25 Years – NHSDA 2001



Note: Data presented are from the 2001 National Household Survey on Drug Abuse; n=560, 18-25 year-olds who smoked during the previous 30 days; analysis was weighted

Trends in Cigarette Smoking Among Adults by Age – United States, Utah, and Kentucky; 1992/93 to 2001/02



Source: National Cancer Institute Tobacco Use Supplements to the Current Population Survey

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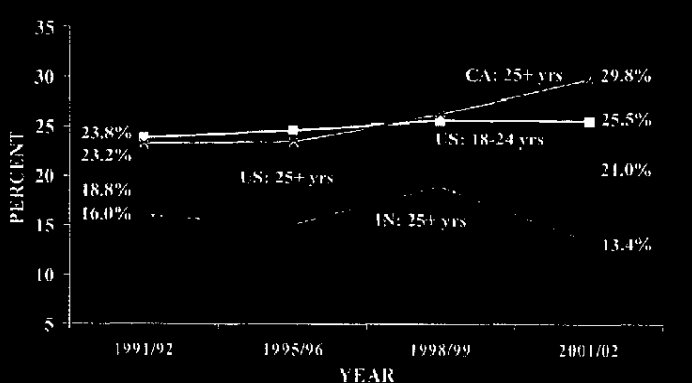
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Prevalence of Cigarette Smoking, ages 25+ years (CPS)

	92/93 (%)	01/02 (%)	% Change
National	24.1	21.2	- 12.0
Low States			
Utah	18.8	13.7	- 27.1
California	19.5	15.4	- 21.0
Mass.	23.1	17.4	- 24.7
High States			
Kentucky	29.7	26.8	- 9.8
Oklahoma	27.0	26.2	- 3.0
Missouri	26.5	26.2	- 1.1

Trends in Someday Smoking Among Current Smokers, by Age – United States, California, and Indiana; 1992/93 to 2001/02



Source: National Cancer Institute Tobacco Use Supplements to the Current Population Survey

PM3006513291

Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Percentage of Current Smokers Who Are Some-Day Smokers, ages 25+ years (CPS)

	92/93 (%)	01/02 (%)	% Change
National	18.8	21.0	+ 11.7
High States			
California	23.2	29.8	+ 28.5
D.C.	29.6	27.3	- 7.8
Texas	21.0	26.4	+ 25.7
Low States			
Indiana	16.0	13.4	- 16.2
Alabama	15.0	14.3	- 4.7
Missouri	15.5	14.9	- 3.9

Percentage of Current Smokers Who Plan to Quit in the Next 30 Days, Ages 25+ years (Current Population Survey)

	92/93 (%)	01/02 (%)	% Change
National	15.9	18.0	+ 13.2
High States			
Washington	15.6	24.1	+ 54.5
Hawaii	10.1	21.6	+113.9
California	16.8	21.6	+ 28.6
Low States			
Alabama	18.9	9.6	- 49.2
Kentucky	11.1	12.5	+ 12.6
N. Carolina	13.0	13.6	+ 4.6

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Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Percentage of Ever Smokers Who Have Quit, Ages 25+ years (Current Population Survey)

	92/93 (%)	01/02 (%)	% Change
National	51.0	49.8	- 2.4
High States			
Utah	54.0	60.1	+ 11.3
Maine	53.5	57.8	+ 8.0
Mass.	56.9	56.3	- 1.0
Low States			
D.C.	42.9	40.2	- 6.3
Oklahoma	46.8	43.1	- 7.9
Mississippi	44.6	43.9	- 1.6

Abstinence of 3+ Months Among Daily Smokers of a Year Ago, ages 25+ years (Current Population Survey)

	92/93 (%)	01/02 (%)	% Change
National	5.7	4.8	- 15.8
High States			
Montana	4.3	8.8	+104.6
Mississippi	6.1	7.5	+ 23.0
Iowa	4.5	7.4	+ 64.4
Low States			
Louisiana	8.1	1.2	- 85.2
Oklahoma	6.8	2.3	- 66.2
Arkansas	6.4	2.4	- 62.5

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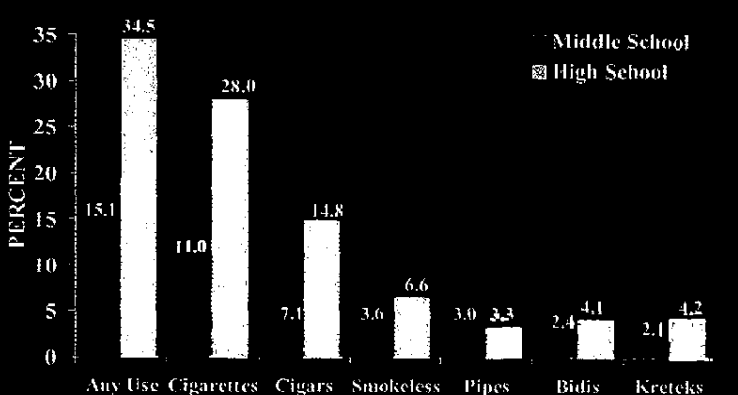
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Percentage of 18-24 Year Olds Who Have Never Smoked 100+ Lifetime Cigarettes (Current Population Survey)

	92/93 (%)	01/02 (%)	% Change
National	71.5	70.7	- 1.1
High States			
D.C.	77.2	82.3	+ 6.6
Utah	74.8	79.5	+ 6.3
California	77.7	78.9	+ 1.5
Low States			
Maine	58.3	58.0	- 0.5
Wisconsin	61.1	59.7	- 2.3
Vermont	63.9	59.8	- 6.4

Current Use Among Middle and High School Students by Type of Tobacco Product – National Youth Tobacco Survey, 2000



Note: Used tobacco on ≥ 1 of the 30 days preceding the survey
Source: American Legacy Foundation, National Youth Tobacco Survey

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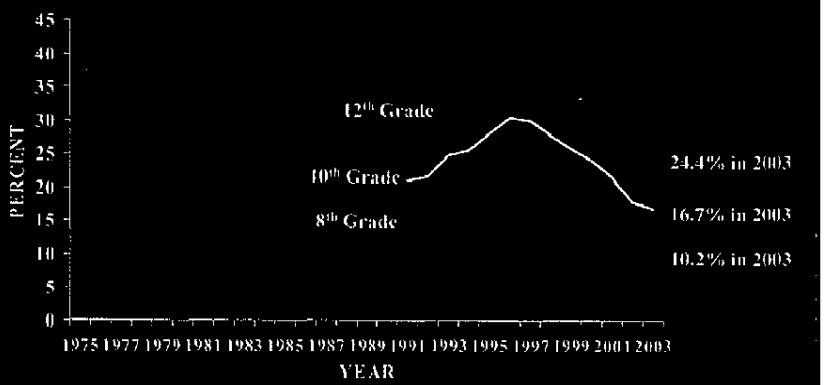
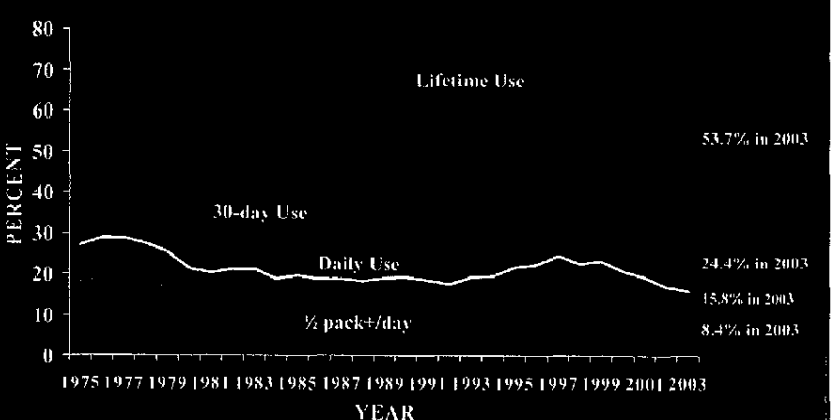
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Trends in Cigarette Smoking Anytime in the Past 30 days by Grade in School – United States, 1975-2003



Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys

Trends in Cigarette Use among 12th Grade Students -- United States, 1975-2003



Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys

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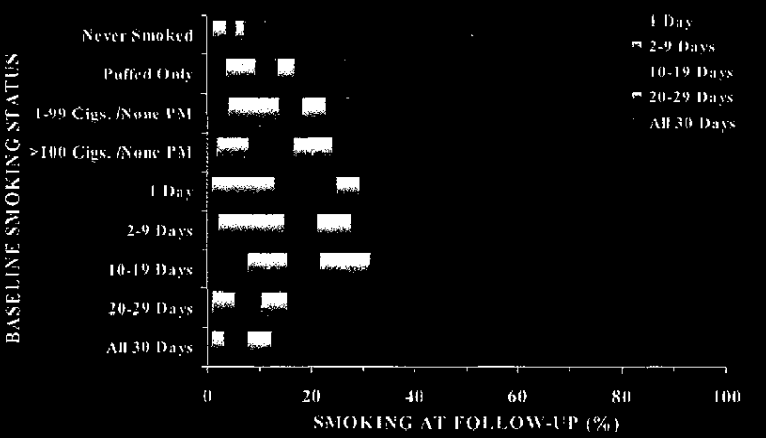
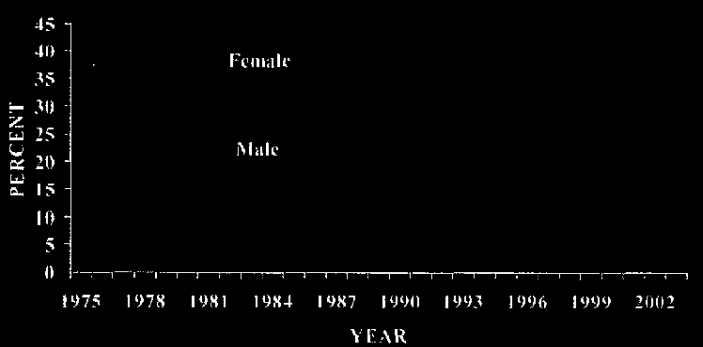
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Follow-up Smoking Status of TAPS I and TAPS II Respondents by Baseline Smoking Status – United States, 1989-1993



TAPS - Teenage Attitudes and Practices Surveys
Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys

Trends in Prevalence of Past Month Cigarette Smoking Among High School Seniors by Gender – United States, 1975-2003



Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys

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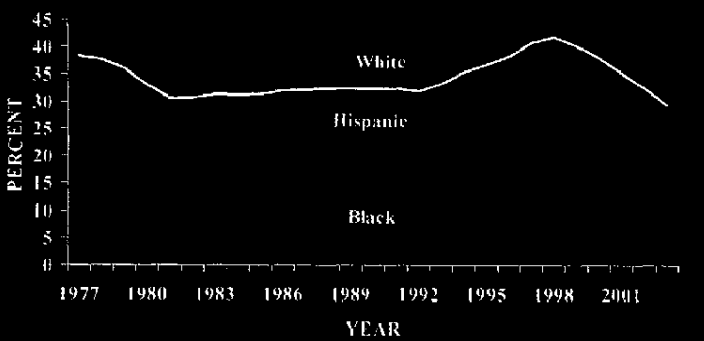
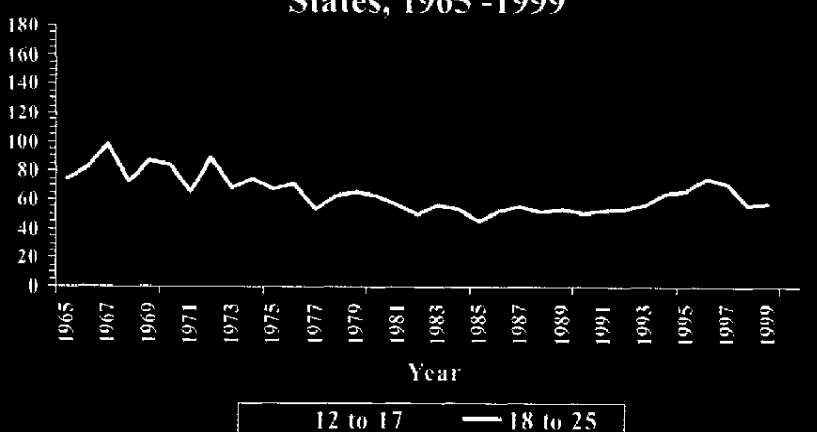
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Trends in Prevalence of Past Month Cigarette Smoking Among High School Seniors by Race – United States, 1977-2003



Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys; for racial subgroups, data for the current year and the previous year are combined.

Trends in the Incidence of Initiation Among Young People of Any Cigarette Use – United States, 1965 -1999



Source: SAMHSA: Office of Applied Studies. 1999 and 2000 National Household Survey on Drug Abuse.

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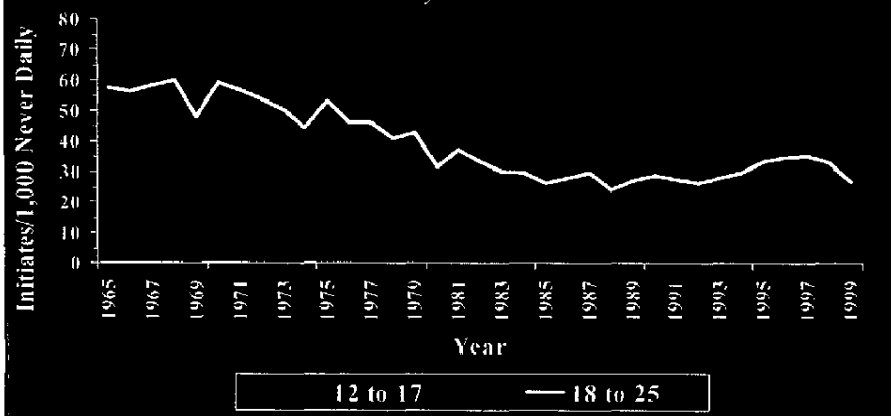
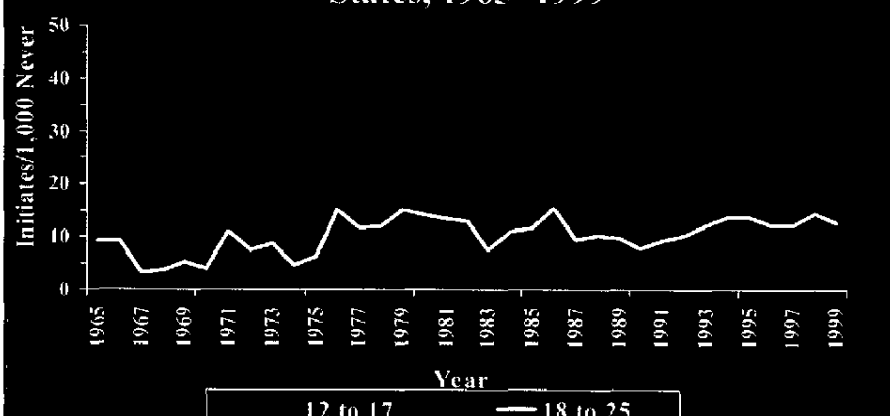
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Trends in the Incidence of Initiation Among Young People of Daily Cigarette Use – United States, 1965 -1999



Source: SAMHSA: Office of Applied Studies. 1999 and 2000 National Household Survey on Drug Abuse.

Trends in the Incidence of Initiation Among Young People of Smokeless Tobacco Use – United States, 1965 -1999



Source: SAMHSA: Office of Applied Studies. 1999 and 2000 National Household Survey on Drug Abuse.

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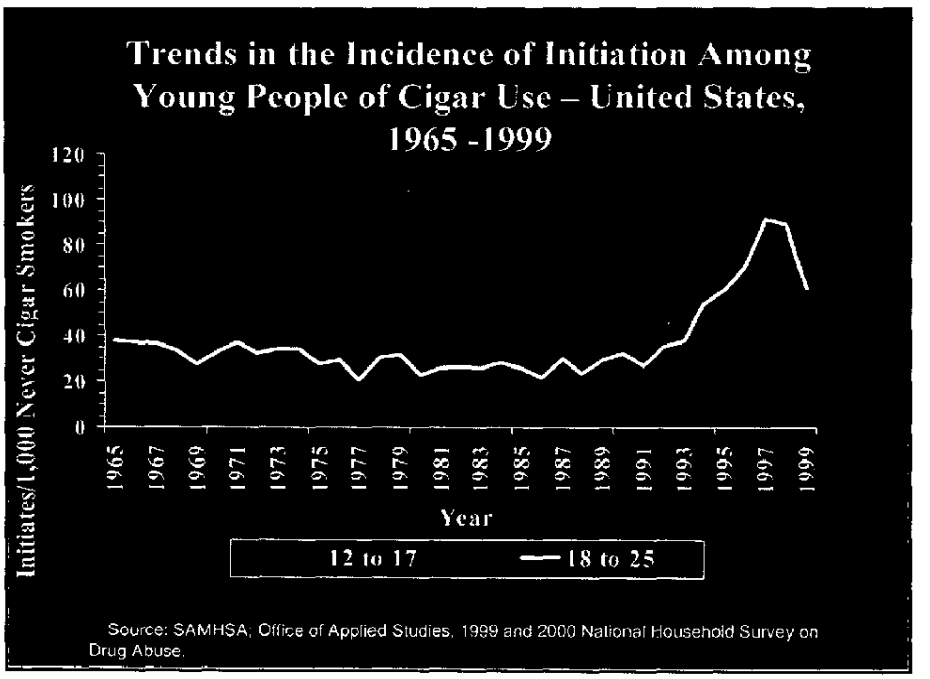
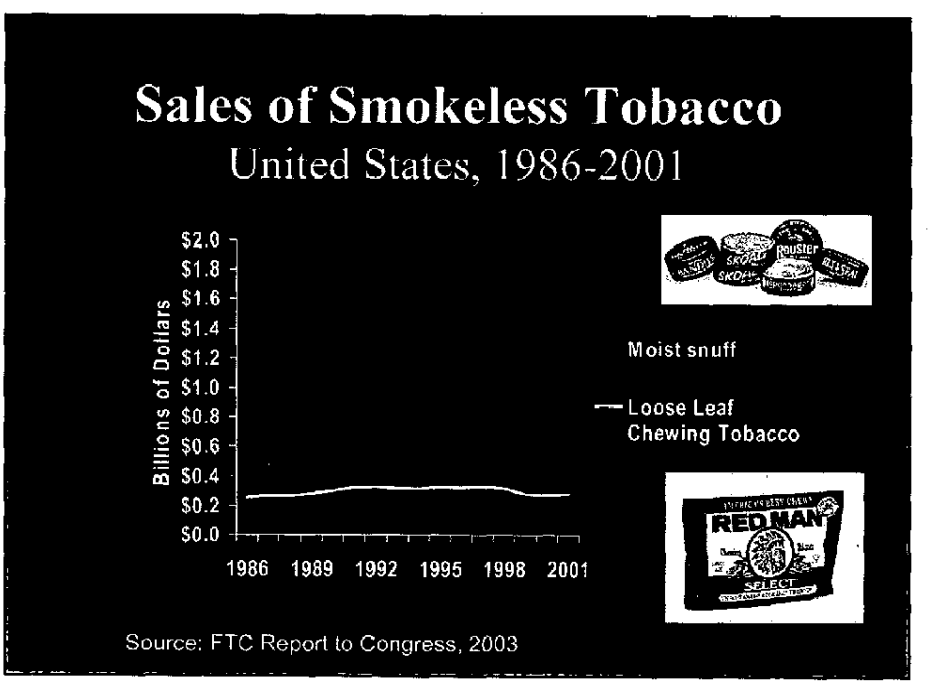
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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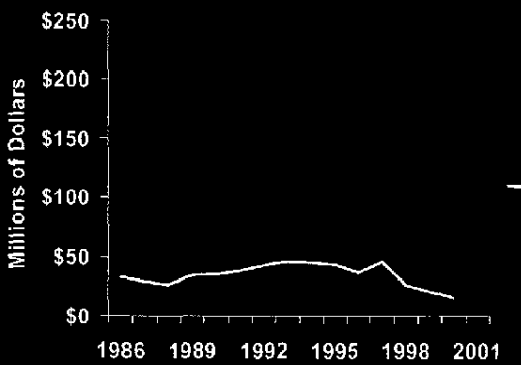
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Advertising and Promotional Expenditures for ST
United States, 1986-2001

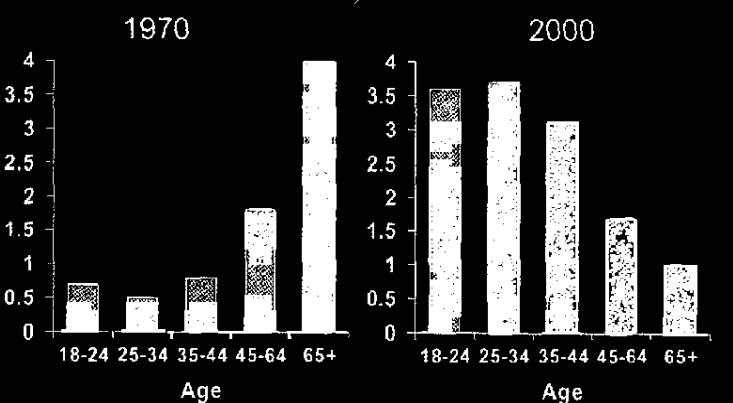


Moist snuff

Loose Leaf Chewing Tobacco

Source: FTC Report to Congress, 2001

Prevalence of Snuff Use Among Men, by Age
United States, 1970 and 2000



Source: 1970 and 2000 National Health Interview Surveys

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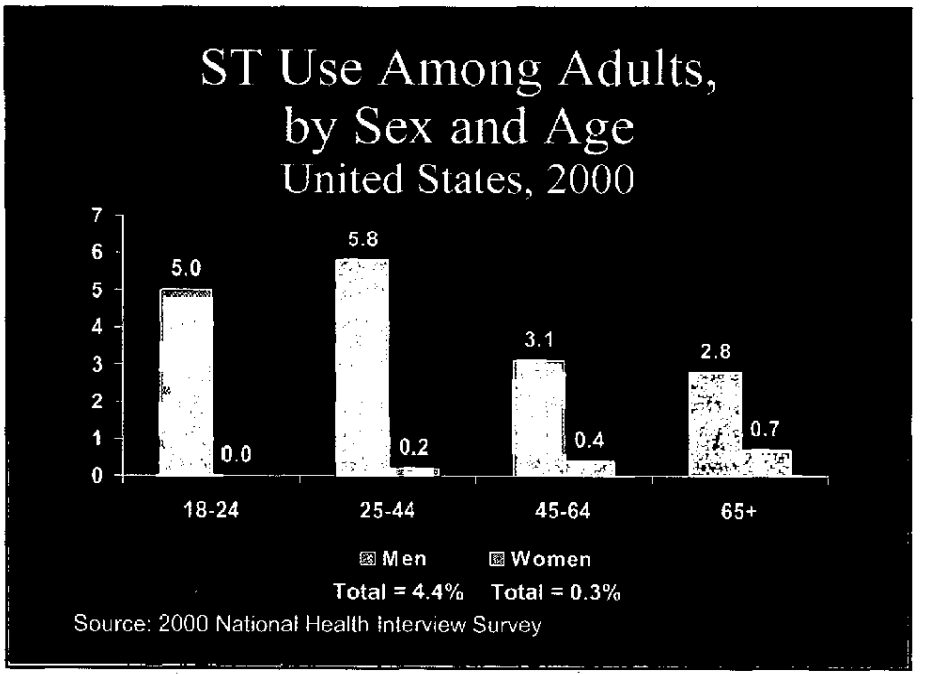
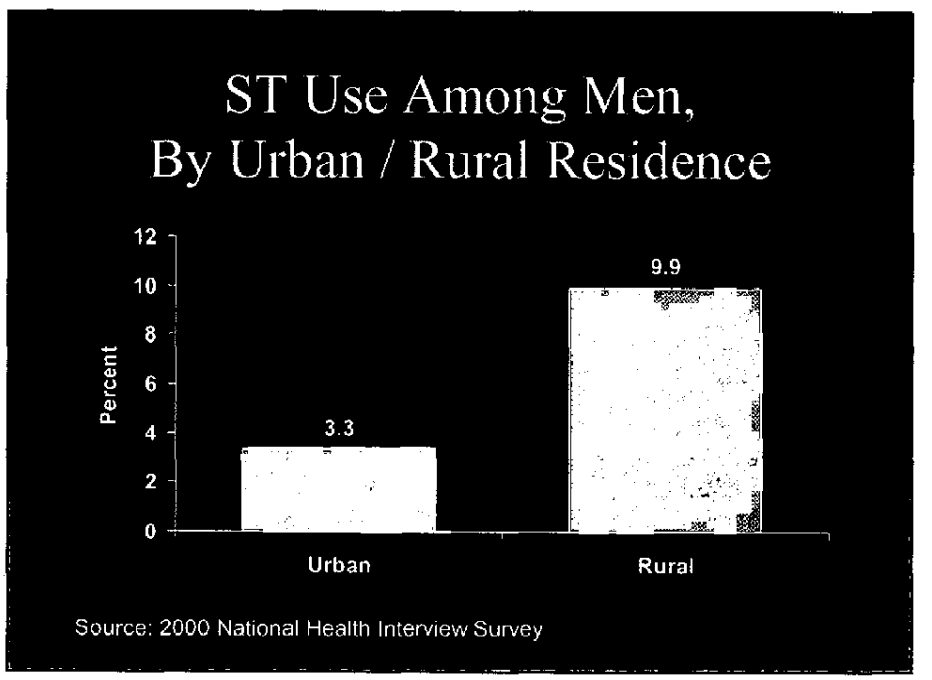
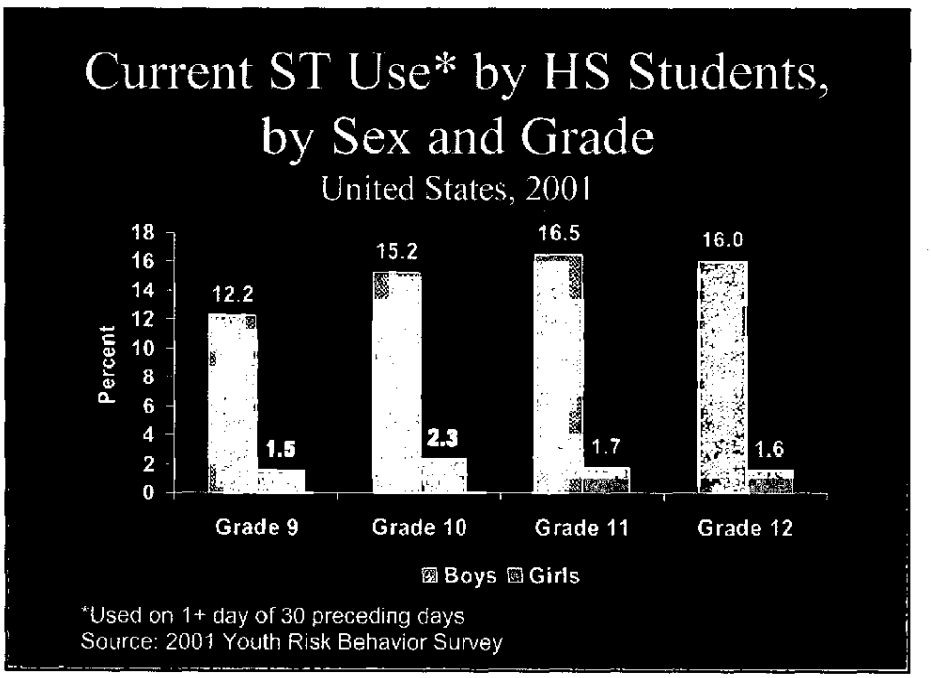
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

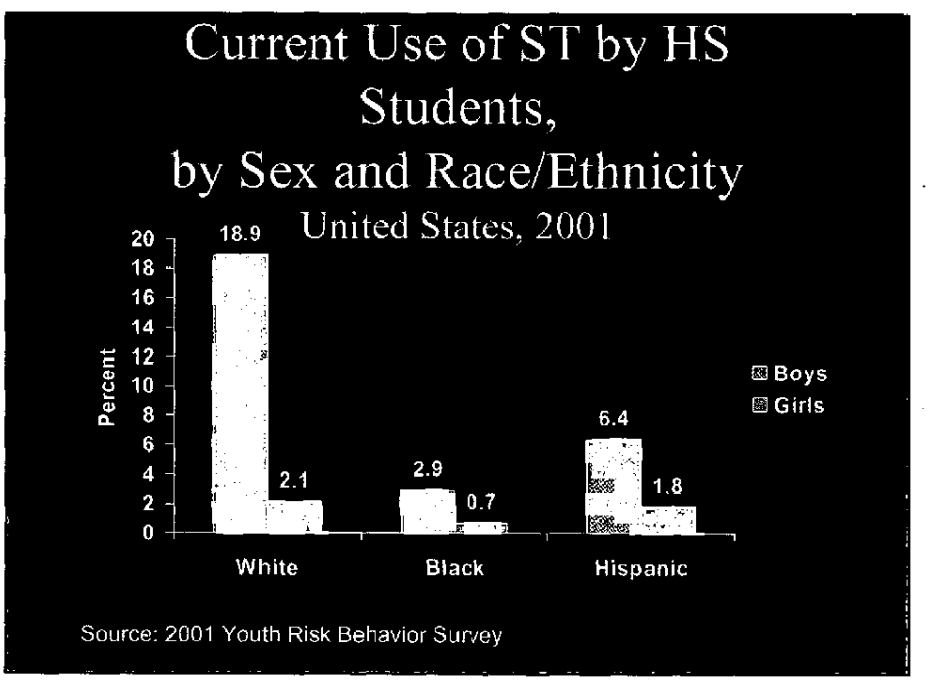




PM3006513301

Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





PM3006513302

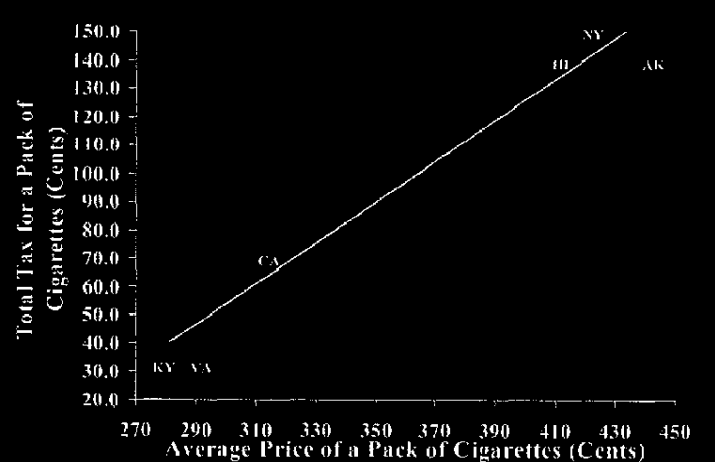
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Monitoring Needs: Marketing

- Newspaper & magazine advertising – text & images
- Direct mail marketing
- Retail environment advertising & promotions
- Pricing strategies
- Placement & portrayals of product in movies & on TV
- Internet (marketing, sales, chat rooms, corporate web sites)
- Sponsorship (television, events, bar nights)
- Product packaging
- Newspaper & magazine articles, editorials, & op-ed pieces
- Television stories, commentaries
- Tobacco industry "anti-tobacco" efforts
- Tobacco industry efforts to counter tobacco control
- Cessation Programs

Further details available in the National Tobacco Monitoring, Research, & Evaluation Workshop materials.

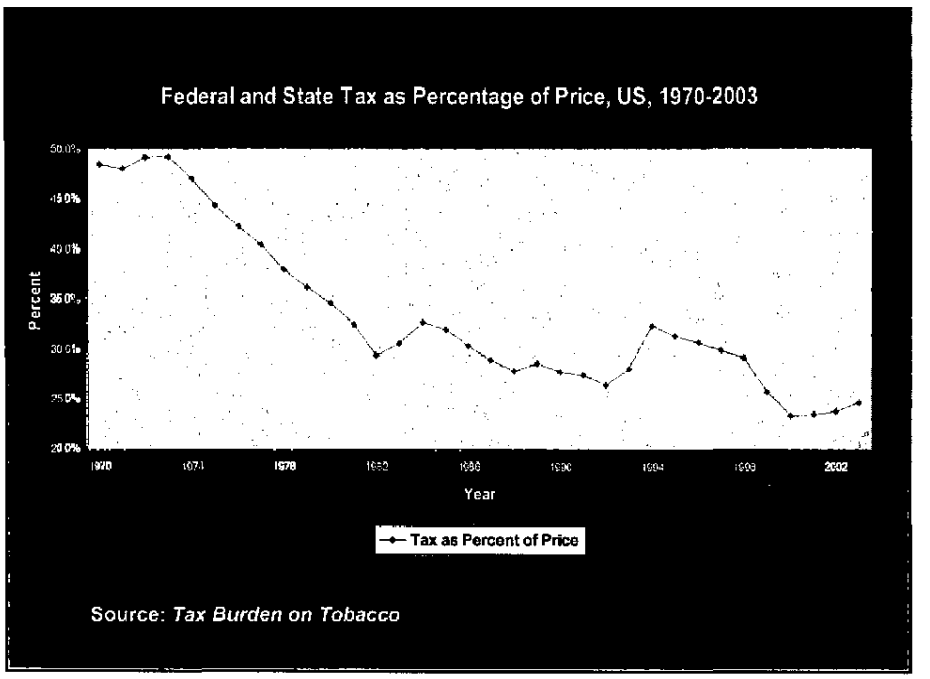
Total Tax for a Pack of Cigarettes [1] and Average Price of a Pack of Cigarettes [2] in the United States, 2001

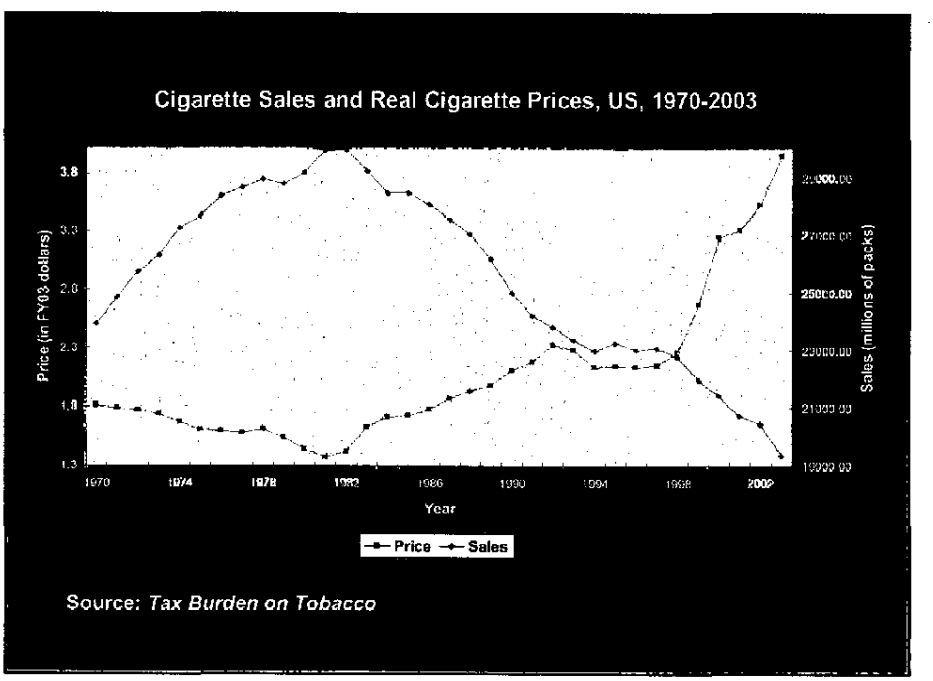


Note: Tax and price of cigarettes were adjusted for inflation;
Price of cigarettes included generic cigarettes.

PM3006513303

Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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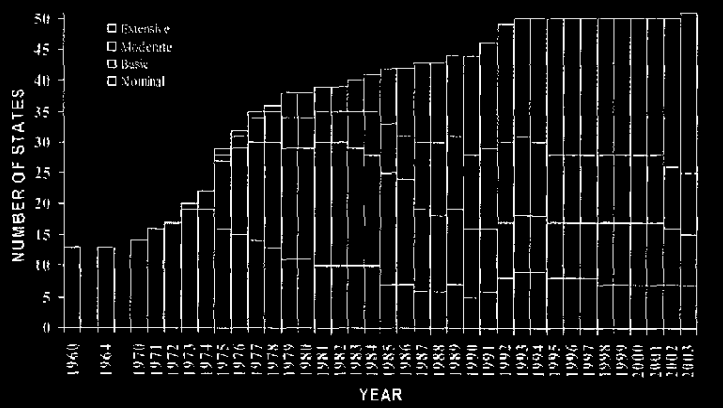
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

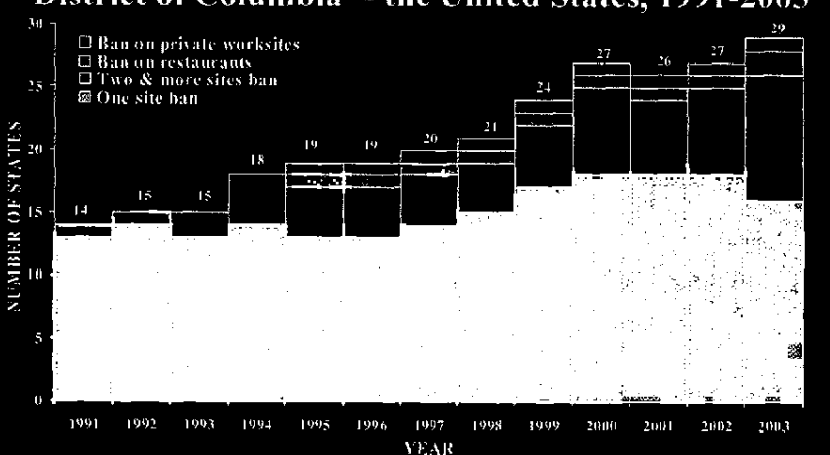
Restrictiveness Of State Laws Regulating Smoking In Public Places – U.S., 1960-2003*



Sources: 1989 Surgeon General's Report, ALA's SLATI, CDC's STATE system, MayaTech Corporation, Roswell Park Cancer Institute. Note: Includes the District of Columbia;

* 2003 data are represented for the first three quarters of the year.

Smoke-Free Air Legislation in the 50 States and the District of Columbia -- the United States, 1991-2003



Sources: ALA's SLATI, CDC's STATE system, and the Roswell Park Cancer Institute.

Notes:
1. Ban on private worksites excludes ban on restaurants but does not exclude ban on other sites;
2. Ban on restaurants excludes ban on private worksites but does not exclude ban on other sites;
3. One site ban and two & more sites ban exclude ban on private worksites and restaurants.

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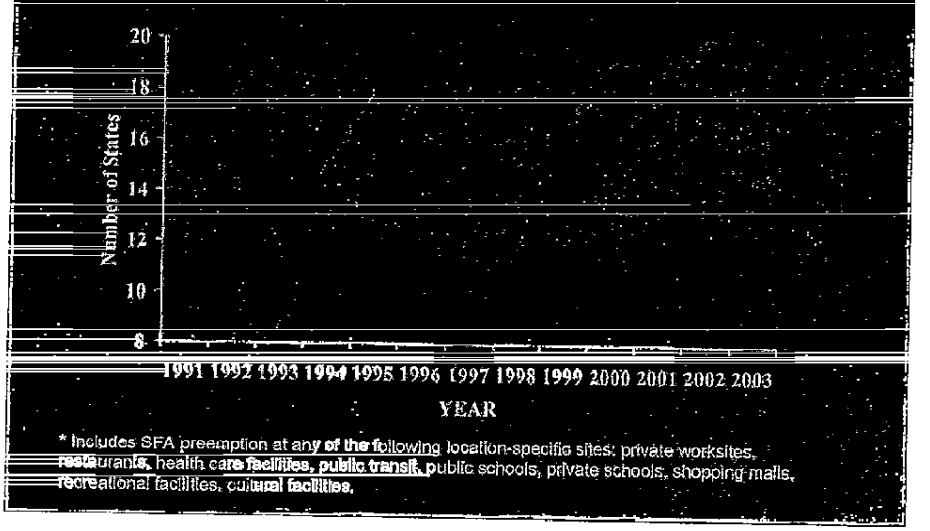
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Number of States with Any Smokefree Air Preemption* -- United States, 1991-2003



* Includes SFA preemption at any of the following location-specific sites: private worksites, restaurants, health care facilities, public transit, public schools, private schools, shopping malls, recreational facilities, cultural facilities.

Smoke-Free Work Places – ages 25+ years (CPS)

	92/93 (%)	01/02 (%)	% Change
National	45.6	69.4	+ 52.2
High States			
Utah	65.0	87.5	+ 33.8
Maine	55.0	79.5	+ 44.6
Mass.	45.1	79.4	+ 76.0
Low States			
Nevada	32.0	49.9	+ 55.9
Hawaii	45.4	57.2	+ 26.0
Kentucky	31.1	59.6	+ 91.6

PM3006513306

Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Smoke-Free Homes – ages 25+ years (CPS)

impactTEEN
A Policy Research Partnership to Reduce Youth Substance Use

	92/93 (%)	01/02 (%)	% Change
National	43.6	67.1	+ 53.9
High States			
Utah	67.0	83.9	+ 25.2
California	59.0	79.1	+ 34.1
Idaho	51.9	76.1	+ 46.6
Low States			
Kentucky	26.5	52.4	+ 97.7
W. Virginia	33.0	53.7	+ 62.7
Missouri	34.0	56.6	+ 66.5

Receipt of Stop-Smoking Advice from a Physician During Previous Year – ages 25+ years (CPS)

	92/93 (%)	01/02 (%)	% Change
National	51.9	62.3	+ 20.0
High States			
Hawaii	58.2	76.5	+ 31.4
Vermont	56.8	72.3	+ 27.3
Maine	56.3	71.5	+ 27.0
Low States			
Texas	46.4	53.6	+ 15.5
Arkansas	39.5	54.2	+ 37.2
Nevada	49.2	56.2	+ 14.2

Note: Percentages are among current smokers who had visited a physician during the previous year

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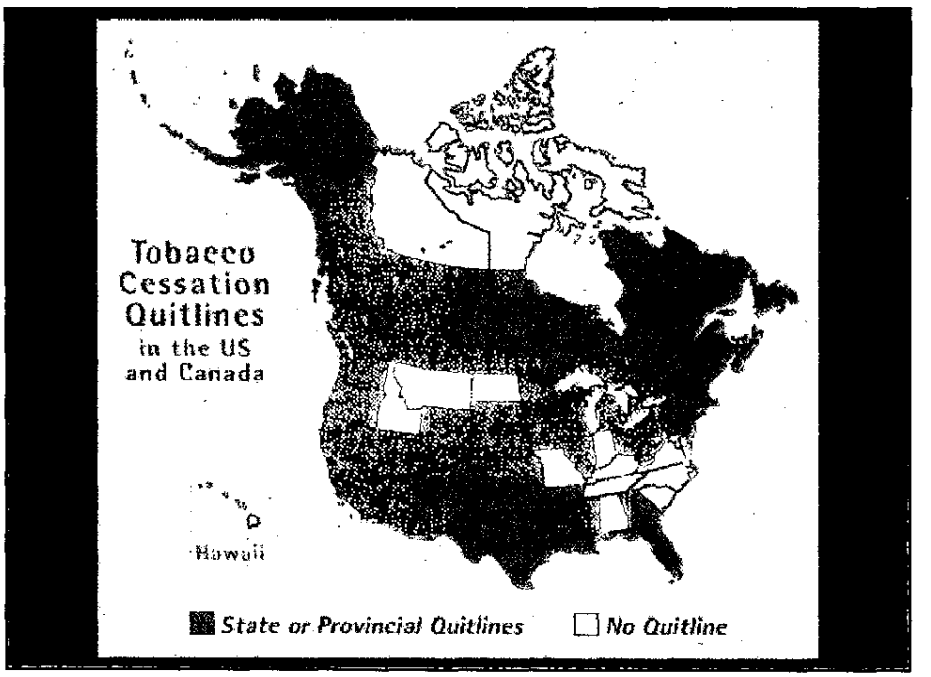
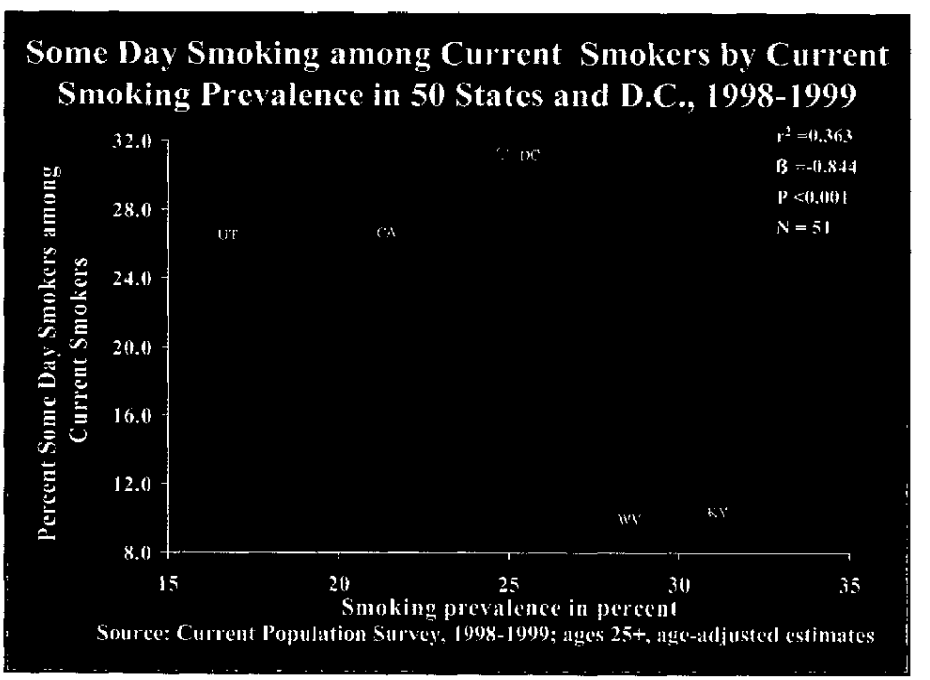
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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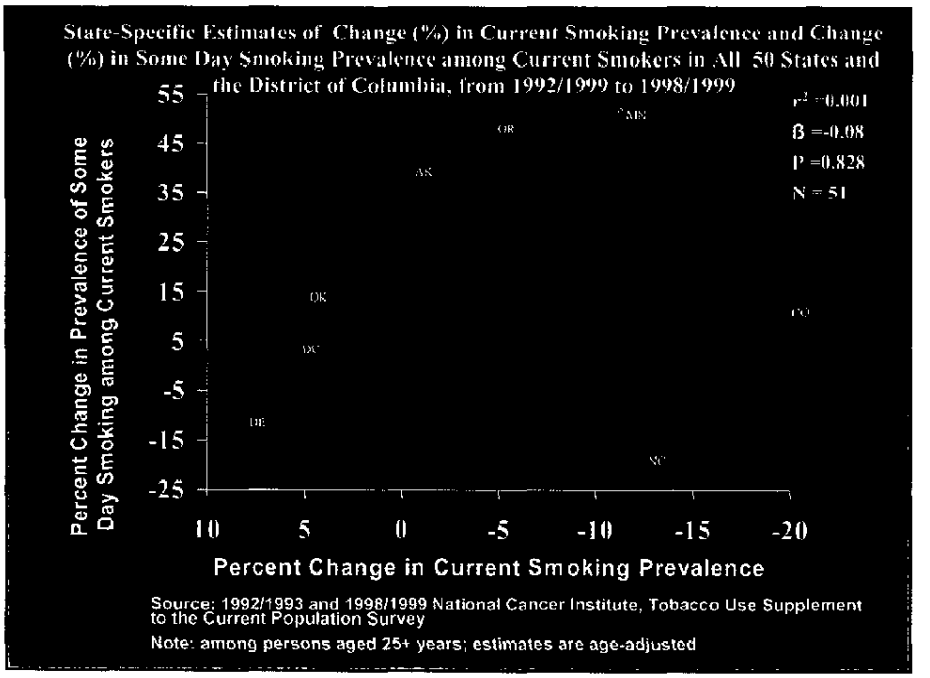
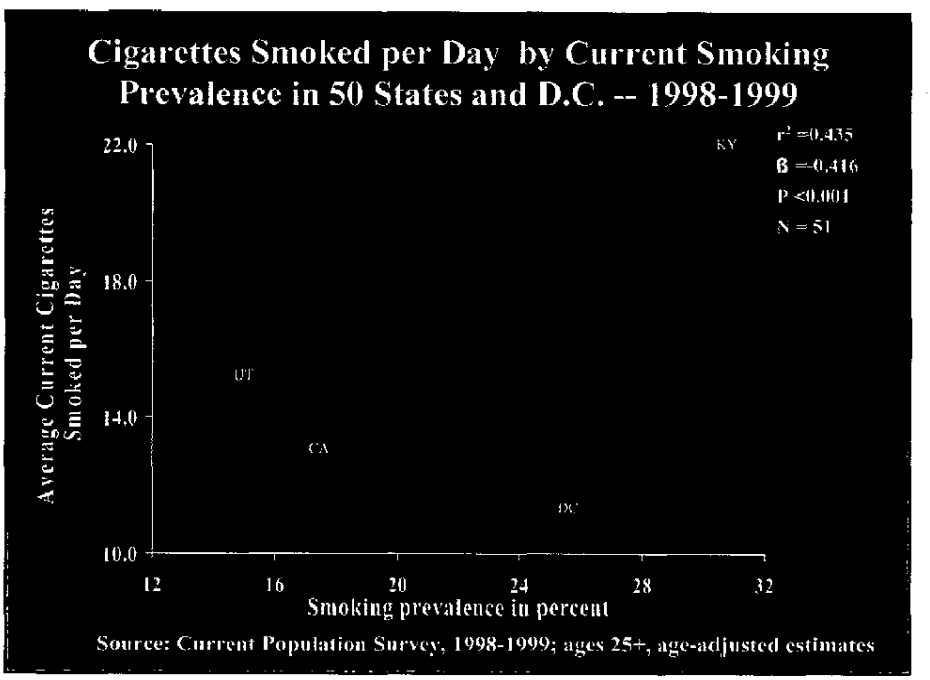
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001





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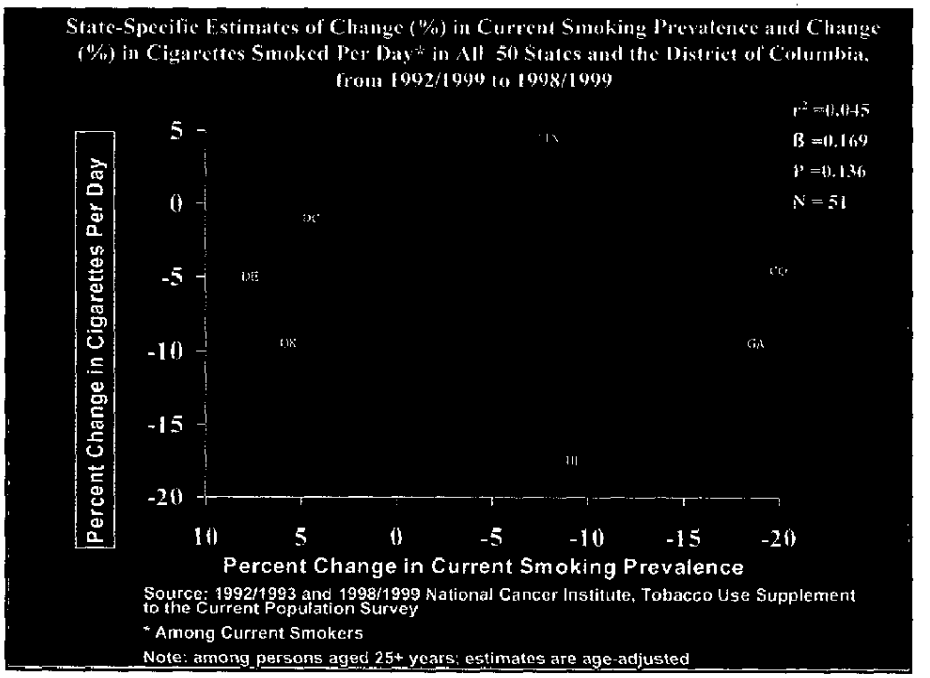
Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001



Optimal Methodologies

- Population-based serial cross sectional surveys AND rolling cohorts – national / state
- Measuring
  - Tobacco use behaviors
  - Dependence
  - Motivation and intentions
  - Co-Morbidities
  - Efficacy, stress, support, coping skills
  - Appropriate body fluids for biomarker and genetic testing

PM3006513310

Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Incorporating Cotinine

- National Health and Nutrition Examination Survey (NHANES III [1988-1991] and NHANES 1999-2000)
- Stratify appropriately
- Assess:
  - cotinine per smoker
  - CPD
  - cotinine per cigarette

Recommendations from the National Tobacco Monitoring, Research, and Evaluation Workshop

- **Industry supplies data on product characteristics**
- **Excise tax increase to permit checking of industry data and implementing enhanced surveillance.**
- **Agent – intra-mural, RFA and contract mechanisms to grow laboratories and research centers.**
- **Host – network activity to review and coordinate surveys (with consideration given to special populations), assess rapid response mechanisms, and develop a clearinghouse.**

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Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

Recommendations from the National Tobacco Monitoring, Research, and Evaluation Workshop

- Vector – NIH research initiative for studies on measurement and impact of tobacco promotional activities leading to a national surveillance system; clearinghouse and annual report.
- Environment – comprehensive monitoring of tobacco control programs and policies.
- Methodology – improve quality and efficiency of data collection, measurement, and analysis

We Need an Integrated System:

- A national, multi-level rolling cohort design that is a system dedicated to this purpose, involving:
  - Product surveillance data
  - Household surveys that collect relevant self-reported information and appropriate biological samples
  - Environmental monitoring providing data that can be linked to the survey data
- Studies of disease outcomes (intermediate and long-term).
  - CPS III or similar project
  - Clinical studies.

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Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001

We Need an Integrated System:

- All of the above would be best coordinated by an independent, transdisciplinary research network.

PM3006513313

Source: https://www.industrydocuments.ucsf.edu/docs/jtgj0001